CLAIMS

What is claimed is:

1. A method of generating and allocating codewords of source words which are to be recorded on a recording medium, the method comprising:

generating codewords satisfying predetermined run length conditions and grouping codewords according to each run length condition; and

allocating the codewords in a code stream such that a codeword for the source word controls suppression of DC components of the code stream.

2. The method of claim 1, further comprising:

when a predetermined boundary condition is not satisfied in the code stream, allocating the codewords such that the codewords which satisfy the boundary condition and maintain the DC control characteristics replace initial codewords.

3. The method of claim 1, wherein in order to make the code stream controlling the suppression of the DC components, allocating the codewords such that a pair of the code stream and an additional code streams having opposite INV characteristics are formed, where the INV characteristics indicate whether the number of '1s' is an odd number or an even number.

4. The method of claim 1, wherein the generating of the codewords comprises:

generating the codewords satisfying the length of a predetermined first codeword and predetermined run length conditions, and grouping the codewords according to each predetermined run length condition to generate a main conversion codeword table;

generating DC control codewords satisfying the length of a predetermined second codeword, and predetermined run length conditions in order to control the DC components in the code stream, and grouping the DC control codewords, and generating a code conversion table for controlling the DC components; and

generating additional DC control codewords by taking the codewords which satisfy the predetermined run length conditions and are not needed in the main conversion codeword table, and grouping the additional DC control codewords.

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5.   The method of claim 4, wherein when the bit length of the source word is 8, the length of a codeword in the main conversion code table is 15 bits.

6.   The method of claim 5, wherein the main conversion code table contains groups of codewords, the codewords each having from 2 to 10 Lead Zeros (LZs), from 1 to 9 LZs, from 1 to 6 LZs, and from 0 to 2 LZs, while having from 0 to 8 End Zeros (EZs).

7.   The method of claim 6, wherein among the groups of the main conversion code table, a group having a lesser number of codewords than the minimum number of codewords for converting the source data takes surplus codewords from a group having a greater number of codewords than the minimum number of codewords so as to amount to the minimum number of codewords.

8.   The method of claim 5, wherein the length of the codewords of the DC control conversion code table is 17 bits.

9.   The method of claim 8, wherein the DC control conversion code table contains groups of codewords, the groups formed of a group of codewords of which LZ is from 2 and to 10, a group of codewords of which LZ is from 1 to 9, a group of codewords of which LZ is from 0 to 6, and a group of codewords of which LZ is from 0 to 2, while EZ is from 0 to 8.

10.   The method of claim 9, wherein each code group of the DC control conversion table has as many codewords as a source word can correspond to pairs of codewords, each pair of codewords has opposite INV characteristics and is selectable.

11.   The method of claim 10, wherein among the groups of the DC control conversion code table, a group having a lesser number of codewords than the minimum number of needed codewords takes surplus codewords from a group having a greater number of codewords than the minimum number of codewords, so as to have equal to or greater than the minimum number of codewords.

12.   The method of claim 8, wherein the auxiliary DC control conversion table comprises:

a group of codewords, each having a length of 15 bits, having from 9 to 10 EZs, and having at least one LZ, and codewords which are taken from surplus codewords of the first main conversion code group;

a group of codewords, each having a length of 15 bits, having from 9 to 10 EZs, and having at least one LZ, and codewords which are taken from surplus codewords of the second main conversion code group;

a group of codewords, each having a length of 15 bits, having from 9 to 10 EZs, and having no LZ, the surplus codewords of the third main conversion code group, and having 7 to 8 LZs, or having 0 to 8 EZs; and

a group of codewords, each having a length of 15 bits, and having 9 or 10 EZs, the surplus codewords of the fourth main conversion code group, and having 3 to 8 LZs and 0 to 8 EZs.

13.   The method of claim 12, wherein when the code stream pairs are a, b1, c and a, b2, c, respectively, and b1 and b2 are DC control codewords having opposite INV characteristics, codewords are allocated such that the INV characteristics of code streams after conversion are maintained to be opposite even if code changes of a, b1, b2, or c occur due to violation of the predetermined run length between a, and b1(b2) or b1(b2) and c.

14.   A method in a run length limited coding system generating codewords to be recorded on a recording medium, the method comprising:

arranging the codewords disposed adjacent to each other to have different opposite polarities from each other, the different opposite polarities representing one of an odd number and an even number of 1s in each codeword; and

arranging the codewords disposed to have a boundary condition representing that the number of continuous 0s between adjacent codewords is more than a predetermined number.

15.   A method in a run length limited coding system generating codewords in a first code group and a second code group to be recorded on a recording medium, the method comprising:

selecting from the first code group one of the cordwords having two different INV polarities representing one of an odd number or an even number of 1s in each codeword; and

allocating the selected one of the codewords of the first code group into the second code group to be arranged and connected to a codeword of the second code group having different INV polarity from the selected one of the cordwords of the first code group.

16.   The method of claim 15, wherein the allocating of the selected one comprises selecting the second code group when the number of the codewords of the second code group is less than a predetermined value.

17.   The method of claim 15, wherein the selecting of the one of the cordwords comprises selecting the first code group when the number of the codewords of the first code group is more than a predetermined value.

18.   The method of claim 15, further comprising:
generating the first code group and second group having adjacent codewords to have a boundary condition representing that the number of continuous 0s between the adjacent codewords is more than a predetermined number.